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(21) Application number: **60046578**(71) Applicant: **HITACHI LTD**(22) Date of filing: **11.03.85**(72) Inventor: **SANO HIDEZO**(54) **TEMPERATURE CONTROLLER**

(57) Abstract:

PURPOSE To eliminate the trouble of dielectric breakdown by a method wherein the surface of electrode is formed into a convex shape corresponding to any expected warping value of substrate to depress the peripheral parts of substrate making them adhere closely to the electrode surface for correcting the warp.

CONSTITUTION A vacuum chamber 1 is high vacuum-exhausted by a vacuum pump system 2 while argon gas 4 is made plasmic by microwave from a microwave producer 3 to produce high concentration plasma 6 by magnets 5. This plasma 6 is carried to a target 7 by a magnetic field including the magnets 5. The target 7 is sputtered by a power supply 8 and a film is formed on a substrate 9 to be bias-sputtered by another power supply 11 of an electrode 11 for making the film flat. The substrate 9 is warped up to the value d around 100 μ m thick proportional to the advancing processes thereof. Any impressed voltage on the electrode 10 may be reduced by using the electrode preliminarily formed into convex shape corresponding to any expected warping value of substrate and depressing the peripheral parts of substrate for correcting the warp.

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